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A COMPARATIVE ANALYSIS OF PPP GOVERNANCE IN SELECTED LATIN AMERICAN COUNTRIES: A QUALITATIVE AND QUANTITATIVE APPROACH

José Luis Bonifaz Fernández [1]*, **jbonifaz@up.edu.pe** **ORCID 0000-0002-3348-5126**

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Resumen

Abstract

This paper aims to propose guidelines for an optimal relationship between a PPP unit and different entities that participate in a PPP process, according to the size of the country and considering the phases of the PPP process. We evaluate the different governance models of this type of alliances in the region. To this end, we analyze the role played in the PPP project cycle by the main public actors (PPP units, Ministries of Finance, Contracting Ministries and the Development Bank). We also seek to quantitatively analyze how the governance of PPPs influences the quality and quantity of projects through the incentives it creates for different actors. After diagnosing and elaborating the guidelines based on the analysis of incentives in institutional frameworks of selected countries, we tested the results considering the INFRASCOPE. This publication contains a ranking of LATAM countries concerning their willingness to carry out PPPs and for this purpose uses variables such as Regulations and Institutions, Project Preparation and Sustainability, Financing, Risk Management and Contract Monitoring, and Performance Evaluation and Impact. This exercise involves using principal component analysis to assess the robustness of the survey. To facilitate the analysis and interpretation, we standardized the scores of the factors assigned to each indicator along the scale from 0 to 100. The result of the exercise indicates that Brazil and Chile are the countries with the best governance conditions for PPPs. Peru, Costa Rica, Colombia, El Salvador and Mexico also have desirable levels of governance.

Keywords: Concessions, PPPs, Governance, Principal Component Analysis..

[1] *Universidad del Pacífico, Perú.*

1 Introduction

Infrastructure is one of the key drivers of sustainable and inclusive economic growth; because it is not only about creating wealth, but also about meeting needs and generating long-term well-being for the majority of the population. The infrastructure needs are enormous. Several estimates consider that, to close the infrastructure gap, Latin America and the Caribbean should invest at least 5 % of GDP in infrastructure over an extended period of time (Prats, 2016) and to achieve this goal, the participation of the private sector through Public-Private Partnerships (PPPs) is key.

Public-Private Partnerships are a contractual mechanism between the public sector and the private sector that aims to provide a public asset or service, in which the private party assumes the risk of investment, construction, operation and / or maintenance, under State regulations. This system differs from the execution, operation and maintenance of a public infrastructure when it is fully managed by the State and using public resources. That is, through the Traditional Public Works (OPT) provision, the State assumes the cost of construction, operation, maintenance and rehabilitation of public works, without resorting to any type of financing from the private sector.

PPPs are complex long-duration contractual structures, with higher transaction and financing costs than conventional procedures. PPPs also require a trained government in matters of structuring, use and execution. This need for training can be even more recurrent in regional or local administrations, where sometimes, the allocation of resources has an insufficient design to manage this type of contract and do not have sufficient guarantees to make sustainable projects (CAF, 2018). In addition, it should be noted that PPP projects are limited in terms of space and time, unlike indefinite privatizations, which can transfer an entire system to the private sector for an indefinite period of time, while a PPP transfers to the private sector certain responsibilities related to a project limited in terms of objectives, space and time. Latin American countries have approached PPPs with different institutional arrangements. At the institutional level, Chile has a more centralized model: an office of the Ministry of Public Works promotes projects, coordinates their preparation and supervises their construction and operation. In Peru, a private investment promotion agency (ProInversion) handles transactions and the promotion of PPPs in all sectors. However, in the Peruvian and Chilean case, the scheme would be less centralized by delegating supervisory (and regulatory) work to an independent regulatory institution that administer the contracts. In Colombia, the National Planning Department oversees investment in all sectors, although they also have sectoral regulatory institutions (Prats, 2016).

The objective of this study is to propose guidelines for an optimal relationship between the PPP unit and the different entities that participate in a PPP process, according to the size of the country and considering the phases of the PPP process. Thus, this document aims to analyze the different governance models of PPPs for Colombia, Chile and Peru. To this end, we analyze the role played in the PPP project cycle by the main public actors (PPP units, Ministries of Finance, Contracting Ministries and Development Banking). We also seek to quantitatively analyze how the governance of PPPs influences the quality and quantity of projects through the incentives it creates for the different actors.

This paper is divided into five sections. The first section outlines the regulatory framework for Public-Private Partnerships in Latin America. In the second section we discuss good practices in PPP governance. Finally, after carrying out the diagnosis and elaborating the guidelines based on the analysis of incentives in institutional frameworks of selected countries, we test the results considering the Infrascope. This publication contains a ranking of LATAM countries with respect to their willingness to carry out PPPs; for this purpose, it uses variables such as Regulations and Institutions, Project Preparation and Sustainability, Financing, Risk Management and Contract Monitoring, and Performance Evaluation and Impact.

This exercise involves the use of Principal Component Analysis (PCA) to assess the robustness of the survey . The exercise consists of finding weights for each one of the variables in question with the objective of maximizing the variation in the linear compound of these variables. In other words, this approach makes it possible to identify patterns in the data and express the data to highlight their similarities and differences. Since patterns in the data can be difficult to find in high-dimensional data, PCA can help to analyze the data.

2 Literature review

A first study by Andrés et al (2007) evaluates the governance of regulatory agencies in the electricity sector in Latin American and Caribbean (LAC) countries. The authors develop a regulatory governance index and rank all agencies in LAC countries. The index is an aggregate number of the assessment of four key governance characteristics: autonomy, transparency, accountability and regulatory tools. Through this evaluation, the authors identified a country's particular shortcomings with

respect to governance and indicated the necessary improvements. They conclude that the region shows an overall design of good governance of its regulatory agencies, however, the implementation of the independent regulator model still faces several challenges. This is particularly evident in political autonomy and in the informal aspects of governance, where the region shows the highest number of countries with the lowest scores.

For his part, Prats (2016), analyze how the governance of PPPs influences the quality of projects through the incentives that it creates for different actors. This paper concludes that the governance of PPPs must be used to promote PPPs as an instrument to improve the scope and efficiency of public investments through the conjugation of the design, financing, construction and operation, and maintenance phases of an infrastructure. Engel et al (2014), explain that PPPs are an intermediate alternative between the public or private provision of services. They also try to explain the advantages and disadvantages that PPPs have compared to public and private provision, away from the ideological biases that usually accompany these discussions. To this end, they make a broad review of both theoretical and empirical researches, and the experiences that exist in several countries with different levels of development. In this sense, this work has two specific objectives: 1) it attempts to classify projects and development conditions of the countries for which public provision, PPP or private provision, is better; 2) issues recommendations on the preparation of PPP contracts between the government and the private firm, as well as the correct way to treat them in public finances.

Khallaf et al (2018), point out that PPPs involve a variety of project governance structures which have in common the long-term contractual period between multiple public and private entities. The authors state that the uncertainty of the duration of a long-term contract, coupled with multi-stakeholder involvement are a challenge for the development of risk strategies for PPPs. Therefore, they explain, it is necessary to systematically frame the risks associated with these projects and explore their dynamics. These risks often arise due to the organizational dynamics of interactions between stakeholders in various risk scenarios. In this paper, a methodology is proposed to systematically identify risks in PPP projects, model the organizational dynamics associated with interactional risks using game theory, and simulate these models to observe a range of potential outcomes. The authors note that the proposed combined approach can help planners prepare for a variety of complex and uncertain scenarios and enable stakeholder management in PPP projects.

Casady et al (2017) aim to develop a deeper understanding of the public sector governance challenges associated with PPP agreements. For this purpose, they apply a "New Governance"framework and an institutional theory perspective to the study of PPPs. As a result, this paper identifies that the effective and efficient execution of PPPs depends on the maturity of institutions, which represent legal, normative and cultural-cognitive rules and processes in society. Several early adopters of PPP projects, including Australia, Canada, and the United Kingdom, have developed mature PPP markets. The United States lags far behind these jurisdictions in the number and timing of PPP projects delivered. Therefore, the authors note that the future expansion of PPPs in the United States requires further institutional development, characterized by elaborate and standardized judicial and regulatory rules, and procedures that govern the interaction between public and private actors. The authors conclude that the use of PPPs in infrastructure delivery is more prevalent if public sector governance accelerates institutional maturity in the field.

2.1 Incentives of the PPP regulatory framework in Latin America

The main hypothesis of this study is that the incentives of agents in the governance model in a PPP process are not correctly aligned with the aim of providing adequate public assets and services. In addition, these incentives do not fit the phases of the PPP process.

The agency theory provides us with a tool to analyze the incentives of actors in the PPP process and to verify if they are aligned with the objective of providing better public services and infrastructure to a country. Thus, one of the decisive elements to achieve a successful public policy lies in the good governance of the project, given how incomplete the contracts tend to be (Grossman and Hart, 1986).

The methodological approach based on agency theory starts from an incentive analysis of the regulatory framework in a group of countries (Colombia, Chile and Peru) based on a diagnosis. To carry out this diagnosis, we have to make the following questions to each phase of the PPP process:

- What is the institutional structure of PPPs?
- How does the institutional framework assign roles and competencies to different actors?

- What are the incentives or controls contained in this institutional framework and how do they promote the objective of expanding coverage and efficient management of services?
- What is the role of the regulation, the comptroller's office and the governing body to implement or modify the incentive scheme?
- What are the problems faced by the policies implemented? What other regulatory instruments could be successfully implemented within the existing institutional framework?

The answers to these questions provide information about the PPP institutional performance. Based on this information, it will be possible to develop regulatory policy guidelines to achieve increases in coverage and quality of service. These guidelines should identify the problem posed by the regulatory framework, the available regulatory instrument and the specific objective that is expected to be achieved with the implementation of the regulatory measures proposed in the guidelines.

2.2 What is the institutional structure of PPPs?

Annex 1 summarizes the different types of PPP governance for Colombia, Chile and Peru. Likewise, the awarding entity is usually a ministry, subnational government or public entity; with the exception of Chile where the Ministry of Public Works centralizes the awarding of PPPs.

2.3 How does the institutional framework assign roles and competencies to different actors?

In the case of Colombia, as shown in Appendix A, the awarding authority is any government agency and there is no specific PPP unit, however, there is the National Planning Department (DNP) whose fundamental objectives are the preparation, monitoring of implementation and evaluation of policy results, general plans, programs and projects of the public sector. Then there is the National Infrastructure Agency (ANI), whose internal organization to address the projects was successful. However, the increased in activity derived from the large number of projects to be managed, both public and private initiative, has led to the capacity of the ANI to become too small, resulting in delays in processing. Another problem is the limited decision-making capacity of the ANI's intermediate positions, which in some cases has generated bottlenecks in project management (Vasallo, 2017).

The ANI was created as a technically sound entity, but only dedicated to national transport projects. Vasallo (2017) points out that another problem identified is the fact that the program was too large and was launched in such a short period of time that the national financial system was not sufficiently prepared to address this new model due to lack of capacity and experience. The national banks had little experience in project finance because the projects of the previous three generations passed on little risk to the private sector and the loans were too short-term. This aspect shows that for a program to be successful, it is not only necessary that the public sector does things well, but that the private sector is sufficiently prepared. From this, it is concluded that there are overlaps between the different institutions (DNP, the ANI, the Ministry of Finance and Public Credit, the National Council for Social and Economic Policy, and the Higher Council for Fiscal Policy) to achieve their objectives. The fact that there is not a single awarding authority and several PPP units, often generates deficiency in the structuring of PPP projects, which causes accumulation of balances and problems in executions, which represents greater times, costs and investments with deficiencies in quality.

In Chile, the General Directorate of Public Works Concessions of the Ministry of Public Works (MOP) is the awarding authority and the PPP unit. The General Directorate of Public Works Concessions is the area in charge at ministerial level of providing, preserving and improving public infrastructure works and services within the framework of public-private partnership. The Public Infrastructure Concessions Program developed by the MOP pursues three fundamental objectives: Raising private resources to help finance the development of future public works; outsourcing of the construction and operation of public infrastructure works, seeking optimal levels of services for which users are willing to pay; and the release of public resources to direct them to projects and programs of high social profitability. Moreover, the Ministry of Public Works controls PPP projects; while the National Public Investment System (SNIP) is in charge of the evaluation of these projects.

In general, these institutions are aligned in their functions to give fluidity to PPP projects by improving the concession process in Chile. This country has improved its PPP institutional framework, the stability of a specific PPP agency and the resources for project preparation. These project preparation resources are usually found within the specific PPP agency and are essential for promoting PPPs among sectoral ministries, which may lack specialized staff or expertise. On the other hand, it should be noted that Chile does not have a national investment plan or strategy. The planning of public investment

is developed from the ministries according to the identified investment needs. Each of the ministries develops plans and strategies with different temporalities. An example of this type of plan is the Chile 30/30 Plan prepared by the Ministry of Public Works or the Energy 2050 Plan of the Ministry of Energy.

In Peru we have four PPP regulatory agencies which are Ositran (transport), Osiptel (telecommunications), Osinergmin (energy and mining) and SUNASS (water and sanitation). The functions of each of these entities are to supervise, regulate, regulate, supervise, sanction, resolve disputes and address complaints related to the activities or services that involve the sector in charge of each of them. For its part, the PPP unit is the Agency for the Promotion of Private Investment (ProInversion), responsible for the direction of policies and training of other public authorities, the promotion of PPPs, technical support in the implementation of projects and their award.

2.4 What are the incentives or controls contained in this institutional framework, and how do they promote the objective of expanding coverage and efficient management of services?

One of the incentives that are contained in the Colombian institutional framework is financing. In these projects, the financing risk is entirely assumed by the concessionaire, and its obligation is also to obtain the financial resources – both debt and equity – necessary to meet the obligations stipulated in each contract. There is another incentive which is the traffic guarantee; for example, in 4G concession contracts they have built-in contingencies to mitigate traffic risk. Each contract establishes a minimum value of the present value of project traffic revenue (VPIP). In the event of an expected traffic drop, the ANI will pay the concessionaire the difference between the actual revenue and the VPIP agreed in years 8, 13, 18 and, if applicable, in year 29 of the concession. On the other hand, if the concessionaire reaches the VPIP before the end of the minimum term, he must continue to operate the road until year 25, receiving only a percentage of the total toll income.

Then there is the term of the contract that varies between a minimum of 25 and a maximum of 29 years. If the concessionaire has not reached the VPIP by year 25, the term of the contract will be extended until the first of: (a) four additional years and (b) the date on which the VPIP is reached. If the VPIP is not reached during the term of the contract, including the possible extension of the contract, the contract will end in year 29 and the concessionaire will be compensated through the corresponding payment for termination, for the part of the VPIP that did not materialize.

As mentioned above, the institutional and regulatory system of PPPs in Colombia is fragmented, and that can generate some problems such as the delay in the execution of these projects, this due to the lack of synchrony between the various parties.

Chile, for its part, points out that the works will be carried out at the sole risk of the concessionaire, and it is for him to face as many disbursements as necessary until their total completion, whether they come from fortuitous event, force majeure, or any other cause. The Treasury will not be responsible for the consequences derived from the contracts concluded by the concessionaire with the builders or suppliers. However, the Treasury will contribute to the payment of damages caused by fortuitous events, if so, established in the bidding conditions.

The bidding rules must explicitly indicate the service levels required for the exploitation stage, their respective indicators and the sanctions. The Ministry of Public Works will be responsible for inspecting and monitoring the concessionaire's compliance with its obligations, both in the construction phase and in the exploitation phase of the work. In case of non-compliance, the Ministry may impose on the concessionaire the sanctions and fines established by the regulations and the bidding rules.

In turn, during the term of the concession contract, the Ministry of Public Works may require the concessionaire to deliver information related to the subcontracts it has concluded and certain information related to its accounting, business management and customer service systems in order to verify the proper performance of the concession. The background received must be kept under reservation. The refusal or unjustified delay in the delivery of the required background and the delivery of inaccurate or unreliable information will be sanctioned with the fines established in the regulations.

In the case of Peru, as part of the mechanisms that protect the grantor from possible breaches of the concessionaire, contractual guarantees are incorporated to make the responsibility of the concessionaire effective and protect the grantor in an adequate and sufficient manner. Thus, these guarantees generate the appropriate incentives to encourage the concessionaire to act in the desired way, in order to fulfill its commitments and the object of the contract. There are two types of guarantees

that the concessionaire grants to the grantor: the guarantee of faithful fulfillment of construction of works and the guarantee of faithful fulfillment of the contract.

In this way, if the dealer does not comply with the respective guarantees stipulated in the contract, then he will be sanctioned with a penalty. The penalty scheme of the contract must be based on an incentive scheme, in which the penalties are greater than the generation of illicit benefits that the concessionaire may incur if it fails to comply with the obligations established in the contract. The penalties established in the contracts must be detailed considering the following characteristics: description of the penalty, amounts of the penalty, criterion of application and form of verification, term of rectification, as it is consistent with the nature of the obligation, stage or phase in which the penalties are applied (design, construction, operation and maintenance).

Thus, the Contract must define reasonable deadlines to make the payment of penalties. However, in the event that the concessionaire does not make these payments within the established deadlines, the contract must provide for the total or partial execution of the guarantees of faithful compliance in force to cover the amount of the penalties imposed, fixing the obligation of the concessionaire to restore these guarantees. Likewise, the penalties must be imposed without prejudice to the fact that the concessionaire must comply with the other obligations at its expense, or compensate the damages caused to third parties as a result of non-compliance. Penalties should relate only to breaches of contractual obligations.

On the other hand, Peru has made progress in recent years in consolidating jurisdictions and strengthening competencies with respect to the institutional framework for PPP. Adequate regulations are now in place to overcome existing problems with PPPs, including a lack of coordinated procedures, ministerial-level know-how and clear procurement.

2.5 What is the role of the regulation, the comptroller's office and the governing body to implement or modify the incentive scheme?

In Colombia, a large part of the management, regulation and supervision of projects is carried out by the National Infrastructure Agency (ANI). The ANI must request a series of technical reviews, approvals and requirements from different governing and approval entities before it can begin the bidding process. This coordination between different entities was characterized by a high level of transparency and led to an improvement in the bidding and awarding process of the projects (Vasallo, 2017). That ANI also fulfills the role to implement or modify the incentive scheme in PPP projects; moreover, it generates standard specifications that gave rise to very little conflict.

On the other hand, we have the National Planning Department of Colombia (DNP), this entity is also in charge of supervising, regulating and planning PPP projects. The DNP is an administrative department that belongs to the executive branch of the government and reports directly to the Presidency of the Republic. The DNP coordinates work for the formulation of the National Development Plan with ministries, territorial authorities and administrative planning regions. It also coordinates the inclusion of relevant comments by the National Planning Council (CNP), the National Council for Economic and Social Policy (CONPES) and other civil society actors. Likewise, the investment programs prepared by Ministries, administrative departments, the Comptroller's Office, the Attorney General's Office, the Prosecutor's Office and other national entities are reviewed by the DNP, which registers viable programs in the Bank of National Investment Programs and Projects, which are then executed on the basis of the General Budget of the Nation.

There is also the Office of the Comptroller General of the Republic of Colombia, whose function is to monitor the fiscal management of the administration to the entities that manage funds or assets of the Nation, evaluate the results obtained, examine the reasonableness of the financial statements of the subjects of fiscal control, generate a culture of control of the patrimony of the state and of public management, establish the fiscal responsibilities and impose the corresponding pecuniary sanctions, as well as the other actions derived from the exercise of fiscal supervision

In the case of Chile, in terms of its role in modifying or implementing the incentive scheme, the Ministry of Public Works (MOP) may impose on the concessionaire that does not comply with its obligations the fines provided in the bidding conditions, both during the construction and operation phases. In addition to this, the Ministry of Public Works may modify the characteristics of the works and services contracted in order to increase the service levels and technical standards established in the bidding conditions. As a result, it must financially compensate the concessionaire, where appropriate, for the additional costs incurred by the concessionaire in this regard.

On the other hand, fines or penalties applied by the MOP must be paid by the concessionaire within 30 days of the date of their written notification. If the concessionaire does not comply with the sanction imposed, within the established period, the MOP will make the guarantees effective, without prejudice to the other actions that may apply. Then, there is also the figure of the tax inspector, who is in charge of supervising that the work is built in a timely manner, as indicated in the bidding conditions. The fiscal inspector must ensure that the detailed engineering and construction projects of the works comply with current regulations and the instructions issued by the technical departments of the MOP. Then, in the operation phase; the tax inspector is responsible for the management and supervision of the contract and its service levels.

Then there is the Office of the Comptroller General of the Republic of Chile, whose main function is to control the legality of administrative acts and safeguard the correct use of public funds. The office of the Comptroller has the objective of verifying that public institutions act within the scope of their powers, respecting legal procedures and efficiently and effectively using public resources. However, the comptroller's office of this country should pay close attention to complementary PPP contracts, given that these contracts are not published and there is often little publicly available information on project expansions through this modality.

In the case of Peru, the Ministry of Economy and Finance indicates that the PPP contract must establish the criteria, rules or procedures applicable to prepare the technical file, the final engineering study, the detailed engineering or the definitive technical specifications for the execution of the project in order to guarantee compliance with the Service Levels established in the Contract.

Thus, the contract must contain clear rules for the preparation of the technical studies of the project, while recognizing that: i) the design risk lies with the concessionaire and ii) the main objective is the achievement of the service levels established in the contract. Thus, under the context of implementing or modifying the incentive scheme, it is pointed out that the contract must establish penalties to the concessionaire if it fails to comply with the obligations derived from it. The penalty of breaches allows an efficient allocation of contract risks, ensuring and preserving the contractual balance existing at the closing date. As mentioned above, the penalty scheme of the contract must be supported by an incentive scheme, in which the penalties are greater than the generation of illicit benefits that the concessionaire may incur if it fails to comply with the obligations established in the contract. It should be noted that penalties should relate only to breaches of contractual obligations. Consequently, violations will not be incorporated into administrative rules established in the law.

The Office of the Comptroller General of the Republic, in accordance with its organic law, exercises prior control over operations, bonds, guarantees and other guarantees granted by the State, including draft contracts, which in any way compromise their credit or financial capacity, whether they are negotiations in the country or abroad. Then, as a result of this work, a previous report is issued that constitutes a technical document, the result of the verification and analysis process of the supporting documentation presented by the entity. In this sense, the PPP regulations specify that the previous report of the Comptroller General of the Republic regarding the final version of the Public-Private Partnerships contract can only refer to those aspects that compromise the credit or financial capacity of the State (Tirado, 2017).

2.6 What are the problems faced by the policies implemented?

One of the problems observed in the policies implemented in the governance of PPPs was that in some countries the awarding authority and the PPP unit is the same, causing an increase in activity derived from the large number of projects to be managed for the same entity. In that sense, the capacity of the entity in charge becomes limited, which generates delays in the processing.

In other cases, it has been seen that the institutional environment for PPPs is fragmented: there is no specific PPP unit or there is no PPP unit at all. There is no specific body that sets policies or oversees the entire system, i.e., there is no centralized PPP unit, which is one of the main weaknesses and the main challenge that should be addressed in the next years. This fragmentation has created obstruction in the efficient planning and effective delivery of projects.

Additionally, there are cases in which there is a lack of an online registration for the projects and the PPP agency does not periodically review the performance of the projects and this generates inefficiency in the system. Then, there are also cases where countries lack a project development fund and a national infrastructure plan.

Another problem detected in the policies implemented is the lack of transparency. For example, in the case of Peru, regulations do not require the publication of bidding documents, and even after invoking public information laws, some of the information may still remain undisclosed. Another problem that has been found in the policies implemented is that there are countries that do not guarantee fair compensation for investors in case the Government terminates the contract early.

2.7 What other regulatory instruments could be successfully implemented within the existing institutional framework?

Agency theory provides us with a tool to analyze the incentives of actors in the PPP process and to verify if they are aligned with the objective of providing better public services and infrastructure to a country. Thus, one of the decisive elements to achieve a successful public policy lies in the good governance of the project, given how incomplete the contracts tend to be (Grossman and Hart, 1986).

For their part, Engel et al. (2014) offer ambitious recommendations on the desirable institutions and governance to implement successful PPP projects. Thus, they propose four different independent agencies: a planning agency, an external council, a superintendence or regulator of the contract and a panel of experts for the renegotiations of contracts.

1) **Planning agency:** The principle of planning establishes that the State and its organs must prioritize and guide the development of PPPs. The principle of planning is contrary to improvisation. Thus, for example, large infrastructure and public service projects should not be hastily developed by the design of a current authority, but as part of a multi-year planning developed previously (Nalvarte, 2017). The function that a planning agency must perform is to design, evaluate and select projects before awarding the contract. Also, as mentioned above, it must be composed of a public body.
2) **External council:** The role to be performed by the external council is to review the cost-benefit evaluations. This council must be composed of experts external to the public sector and without links with the bidding companies, multidisciplinary (economists and engineers).
3) **Superintendence o contract regulator:** The Superintendence of the Public-Private Partnership has to ensure compliance with the contract, monitor performance standards and service quality, and provide information to users and the public once the contract is awarded. This agency is the one that must tender and contract the project, as well as verify the receipt of the assets. In addition to this, it must monitor the evolution of the works, the exploitation and their quality, in addition to drafting the contract management manual. Then, the PPP Superintendence must also have a steering committee; which will be responsible for making strategic decisions of the work and operation. This steering committee must be composed of the management of the superintendence of the PPP and the management of the company. Likewise, the Superintendence of PPPs must have a technical committee, which will be responsible for making operational decisions of the work and operation. This technical committee must be composed of the technicians of the superintendence of the PPP and the company.
4) **Panel of experts for the renegotiations of contracts:** The contract regulator must have a group of independent experts in which its main function is to resolve conflicts between the superintendence and the company and review the renegotiations. This panel must be composed of experts external to the Government and without links to the bidding companies. In addition, it must be multidisciplinary (economists and jurists).

3 Methodology

After carrying out the diagnosis and elaborating the guidelines based on the analysis of incentives in institutional frameworks of selected countries, it is proposed to test the result considering the Infrascope. This publication contains a ranking of those willing to carry out PPPs and uses for this purpose variables such as Regulations and Institutions, Project Preparation and sustainability, Financing, Risk management and Contract monitoring and Performance Evaluation and impact.

This exercise involves the use of principal component (PCA) analysis to assess the robustness of the survey . The exercise consists of finding weights that are given to each of the variables in question, according to the principle that the objective is to maximize the variation in the linear compound of these variables. In other words, this approach makes possible to identify patterns in the data and express the data to highlight their similarities and differences. Since patterns in data can be difficult to find in high-dimensional data, PCA can help analyze the data.

Following Andrés et al (2007), we will use PCA to jointly consider the information provided by the Infrascope components and generate orthogonal components. Factor scores are then calculated for each of the variables, and these scores will be used to calculate governance.

3.1 Infrascope: methodology and data

In 2021, the methodology for the development of the Infrascope was updated by the research team of The Economist Intelligence Unit in consultation with the Inter-American Development Bank (Infrascope, 2022).

The Economist Intelligence Unit then selected a series of predetermined weights that are considered appropriate for the calculation of the overall index. These weights are not intended to represent a final judgment on the relative importance of the indicator. Modeling and weighting of indicators and categories in the index yield scores from 0 to 100 for each country, where 100 represents the highest quality and performance and 0, the lowest. Overall scores are calculated according to a neutral weighting scheme, which means that all categories and indicators have the same importance in the combined score.

Tabla. 1. Component weighting

Category	Weight
Regulations and institutions	20 %
Project Preparation and Sustainability	20 %
Financing	20 %
Risk Management and Contract Monitoring	20 %
Performance Evaluation and Impact (Ex-post)	20 %

Source: Infrascope (2022)

3.2 PPP Governance Ranking

As a first exercise, we will evaluate the governance of PPPs in Latin American and Caribbean countries, considering their overall performance in each of the Infrascope variables (regulations and institutions, project preparation and sustainability, financing, risk management and contract monitoring, and performance evaluation and impact).

Table 2 presents the results of the 2021 Infrascope. According to this analysis, Brazil, Chile, Uruguay, Colombia and Peru are in the top five places in the overall ranking. Brazil improved its overall score in relation to 2020, going from position 5 to position 1; while the other four countries had a decrease in their scores. Despite such a decline, Uruguay rose from 7th to 3rd in the rankings.

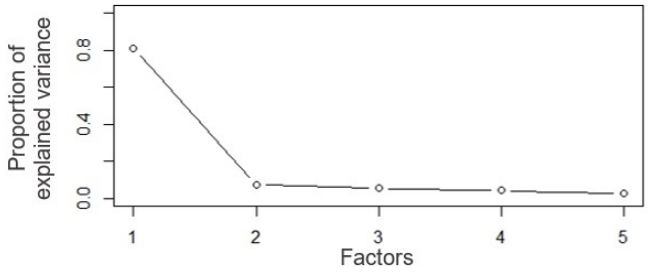
Overall, Peru's performance was uneven across categories: it ranked second in Project Preparation and Sustainability, and fourth in Financing, but ranked in the bottom half of Risk Management and Contact Monitoring, and Evaluation Performance and Impact, and eighth in Regulation and Institutions. Chile and Paraguay obtained the highest results in the Regulations and Institutions category. Chile led the region in this category, just 3.6 points away from the perfect score and with the highest or second highest score for any other category in the index. According to the Infrascope report (2022), Chile stands out in terms of the maturity and depth of its financial environment for PPPs; it also has the best practices for monitoring contracts and leads the region in terms of regulatory or government risk. In 2019, Chile's regulatory framework was ranked as the second best in the region and showed a slight improvement since 2017. In 2017 Chile replaced the previous concessions body (created in 1996) with the new General Directorate of Public Works (DGOP). The DGOP board of directors was selected through a competitive process and has already issued guidelines facilitating unsolicited PPP proposals from the private sector. Brazil was the only country in the top five of the overall ranking in the bottom half of the Regulations and Institutions category.

The Regulations and Institutions category recorded the highest average score. This category measures a country's regulatory and institutional frameworks for private participation in infrastructure through 4 subcategories: enabling regulatory environment and political support for PPPs, an agency dedicated to PPPs, competitiveness and openness in biddings, and fairness and openness to changes in contracts. These indicators measure specific aspects of the legal, regulatory and institutional framework, including the existence of a specific framework for PPPs, the existence of a specific PPP agency, the existence of resources and funds to prepare projects, transparency around PPP reporting, PPP selection criteria, procedures for handling unsolicited proposals, among others. In this category, Chile and Paraguay are in first and second place respectively. The Project Preparation and Sustainability category examines the processes that guide projects and evaluates

the incorporation of sustainability considerations into projects. This category comprises four subcategories: project selection, project preparation and support, efficiency of project preparation and social, and environmental sustainability. The countries that present the best performance in this category are Brazil, Peru and Mexico.

Financing is the category that examines financial frameworks and facilities that support infrastructure development, project financing, and financial sector maturity. This category includes three subcategories: the structure and sources of financing, the level of access to finance, and the macro environment. Risk management and contract monitoring comprises the subcategories of risk allocation, national monitoring and reporting, disaster risk, and government risk. Finally, Evaluation Performance and Impact evaluates ex-post aspects of PPP projects: the maturity and quality of projects, the impact on infrastructure quality, and environmental and social impact. In these three categories Brazil and Chile lead the ranking, in first and second place respectively. With the exception of Risk Management and Contract Monitoring, where Chile ranks first.

Tabla. 2. Infrascope 2021



Source: Infrascope (2022)

3.3 Using principal components analysis

The second exercise is more complex and involved the use of principal component analysis (PCA) . Principal component analysis develops a composite index by objectively defining a real value function on the relevant variables. The principle of this method is that when different characteristics are observed over a set of events, the characteristic with the greatest variation explains a greater proportion of variation in the dependent variable compared to a variable with less variation. As mentioned before, the use of PCA in this exercise is important because it can identify patterns in the data and express the data to highlight their similarities and differences; also, once that these patterns are found, PCA compresses the data by reducing the dimensions, without losing much information.

We use PCA to jointly consider the information provided by the five governance indicators provided by the Infrascope (2022) and generate orthogonal indices to measure the governance of PPPs in Latin American countries. Then, we calculate factor scores for each of the countries and compare their governance. As a first step, we calculate the matrix of correlations of the data.

Tabla. 3. Correlation matrix

	Regulation	**Project Preparation**	**Financing**	**Risk Management**	**Performance Evaluation**
Regulation	1	0.7503	0.7914	0.8236	0.7152
Project Preparation	0.7503	1	0.7748	0.7705	0.6855
Financing	0.7914	0.7748	1	0.8705	0.6793
Risk Management	0.8236	0.7705	0.8705	1	0.7211
Performance Evaluation	0.7152	0.6855	0.6793	0.7211	1

Source: Own elaboration.

From Table 3, we observed that the variables with the highest correlation are risk management and financing (0.8705), followed by risk management and regulation, with a correlation coefficient of 0.8236. The correlation between regulation and financing has a coefficient of 0.7914; while the correlation between project preparation and financing has a coefficient of 0. 7748. The variables with the least correlation are performance evaluation and project preparation (0.6855), and performance evaluation and financing with a correlation coefficient of 0.6793.

As a second step, we calculate the spectral decomposition of the correlation matrix; that is, we will find the eigenvalues and eigenvectors of the correlation matrix. In this sense, we have that the eigenvalues are: 4.038, 0.362, 0.266, 0.211 and 0.124. The eigenvectors or coefficients of the components (factors) are:

Tabla. 4. Principal component coefficients

	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
Regulation	0.4526971	0.07316787	-0.33204869	0.81014	-0.15208104
Project Preparation	0.4408951	0.14878894	0.87531163	0.1119274	0.06910293
Financing	0.4572943	0.37200314	-0.18291384	-0.4809836	-0.62264989
Risk Management	0.4650063	0.22003415	-0.2985507	-0.2592346	0.76093295
Performance Evaluation	0.4187217	-0.88640112	-0.03135655	-0.1805482	-0.07337781

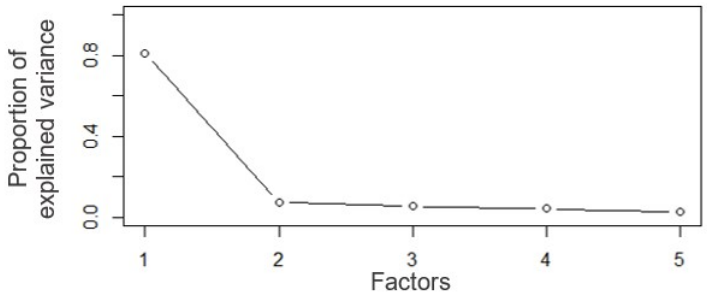
Source: Own elaboration.

The linear functions of the principal components are:

$$
\begin{aligned}
Y_1 &= 0{,}4526971Z_1 + 0{,}4408951Z_2 + 0{,}4572943Z_3 + 0{,}4650063Z_4 + 0{,}4187217Z_5 \\
Y_2 &= 0{,}07316787Z_1 + 0{,}14878894Z_2 + 0{,}37200314Z_3 + 0{,}22003415Z_4 - 0{,}88640112Z_5 \\
Y_3 &= -0{,}33204869Z_1 + 0{,}87531163Z_2 - 0{,}18291384Z_3 - 0{,}2985507Z_4 - 0{,}03135655Z_5 \\
Y_4 &= 0{,}81014Z_1 + 0{,}1119274Z_2 - 0{,}4809836Z_3 - 0{,}2592346Z_4 - 0{,}1805482Z_5 \\
Y_5 &= -0{,}15208104Z_1 + 0{,}06910293Z_2 - 0{,}62264989Z_3 + 0{,}76093295Z_4 - 0{,}07337781Z_5
\end{aligned}
$$

As a third step, we determine how many factors (principal components) we can use in our analysis. Figure 4 and Table 5 provide us with this information in this regard.

Figura. 1. Scree plot



Source: Own elaboration

Figure 4 shows a drastic change in the slope from the second component. This indicates that only the first component is significant, that is, only the fist component explains a large proportion of the variance. For a better illustration of this matter, we look at Table 5; in which we quantitatively represent the percentages of variation explained by each component:

Tabla. 5. Percentage of explained variance for each component

Factors	Eigenvalues	Explained variance	
		%	Cumulative %
1	4.038	80.75 %	80.75 %
2	0.362	7.24 %	87.99 %
3	0.266	5.32 %	93.31 %
4	0.211	4.22 %	97.53 %
5	0.124	2.47 %	100.00 %

Source: Own elaboration.

Table 5 presents the estimated factors and their eigenvalues. This table shows that the first factor explains 80.75 % of the total variation. The percentage of explained variance by the other components is negligible. The information shown in Table 5 is in accordance with the interpretation of Figure 4. After these results, we decide to keep the first component and reject the others. That is, instead of using the original five variables, we will only use the first component.

On the other hand, the following table presents the matrix of correlations between the principal components and the original variables.

Tabla. 6. Correlations between the principal components and the original variables (in absolute values)

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Regulation	**0.9096449**	0.04401173	0.17129034	0.37203719	0.05345194
Project Preparation	**0.88593**	0.08949909	0.45153748	0.05139993	0.02428761
Financing	**0.9188825**	0.22376624	0.09435777	0.22088006	0.21884281
Risk Management	**0.934379**	0.1323543	0.1540101	0.11904723	0.26744517
Performance Evaluation	**0.8413751**	0.53318542	0.01617556	0.08291237	0.0257901

Source: Own elaboration.

According to Table 6, the first factor has a high correlation with all variables. The correlation between the first principal component and Risk Management is the highest (0.934379), and indicates that factor 1 retains 93.44 % of information from the fourth variable (Risk Management). Then, its correlation with Financing is 91.89 %, followed by its correlation with Regulation (0.9096449). In the same way, the correlation between the first factor and Project Preparation (0.88593), and its correlation with Performance Evaluation (0.8413751) are also good, this means that the first factor retains 88.59 % of information from the second variable (Project Preparation) and 84.14 % of information from the fifth variable (Performance Evaluation).

Additionally, we observed that the highest correlation presented by the second principal component is 53.32 % with the fifth variable. On the other hand, the correlations between the other principal components with the variables are less than 50 %.

The conclusion reached is that the first principal component retains almost all the information of the original variables, as shown above in Figure 4, Table 4, Table 5 and Table 6.

4 Results

To facilitate the analysis and interpretation of the results, we normalized the scores of the first principal component assigned to each indicator along the scale of 0 to 100 . This is presented in Table 7, where higher values indicate greater governance in a given factor. The countries selected for this study are Brazil, Chile, Peru, Colombia, El Salvador, Costa Rica

and Mexico.

Table 7 indicates that Brazil and Chile are the countries with the best governance conditions in terms of Regulations and Institutions, Project Preparation and Sustainability, Financing, Risk Management and Contract Monitoring, and Performance Evaluation and Impact; since they have a score greater than 98 points. Colombia also has high governance conditions, obtaining a score of 82.31 points.

Although Peru, Costa Rica, El Salvador and Mexico have diverse scores, they are considered to have desirable governance conditions, since they are above 50 points. On the other hand, Nicaragua, Trinidad and Tobago, Venezuela and Barbados are below 50 points, which reflects significant governance deficits in the indicators of Regulations and Institutions, Project Preparation and Sustainability, Financing, Risk Management and Contract Monitoring, and Performance Evaluation and Impact.

Tabla. 7. Standardized scores of the first principal component for each country

Rank	Country	Factor 1
1	Brazil	100
2	Chile	98.63
3	Uruguay	83.74
4	Colombia	82.31
5	Peru	77.54
6	Panama	74.72
7	Costa Rica	73.77
8	El Salvador	68.81
9	Guatemala	67.95
10	Dominican Republic	67.70
11	Mexico	66.34
12	Jamaica	63.37
13	Honduras	62.62
14	Ecuador	52.62
15	Argentina	51.97
16	Nicaragua	44.92
17	Trinidad and Tobago	12.44
18	Venezuela	0.05
19	Barbados	0

Source: Own elaboration

5 Discussion

This study analyzes the different governance models of Public-Private Partnerships in the region for a group of selected countries. To this end, the role played in the PPP project cycle by the main public actors (PPP units, ministries of Finance, contracting ministries and the Development Bank) was analyzed. In this sense, we observed that in some countries the awarding authority is any government agency; also, many of these countries do not have a specific PPP unit. This could generate some discrepancies in terms of the elaboration of the projects. In other cases, we observed that a single entity is the contracting authority and also the PPP unit; this could generate problems if there is an increase in activity due to the large number of projects to be managed, both public and private initiative, which would lead to the capacity of the entity to become too small for the volume of work it faces, resulting in process delays.

On the other hand, some regulatory instruments that were applied by the countries can still be implemented. For example, as contracts usually have a long-term term validity, they will not be able to regulate all future situations or events that may occur during their validity. Therefore, care should be taken to ensure that contracts are flexible enough to be able to adapt to

the new context, without this implying altering their nature or the economic-financial balance.

Moreover, one objective of information transparency is to reduce levels of corruption. To do this, the general public must be assured about probity, service standards and the costs associated with contracts. It also fosters competition and makes it easier for the market to be better informed to build trust in all the actors involved. As the projects involve social and environmental aspects and considerations of interest to citizens, it is advisable to increase transparency and the dissemination of information. For their part, contracts should have dispute resolution mechanisms that help ensure that discrepancies or conflicts between the parties are resolved quickly and efficiently. This would avoid the interruption of public services and the continued provision of public infrastructure. Due to the complexity and long term of the contracts, they tend to be incomplete, which creates a space for differences in the interpretation and understanding of the clauses of the contractual agreement between the grantor and the concessionaire.

6 Conclusions

Finally, a quantitative evaluation of PPP governance in the selected Latin American countries was made, analyzing the trend of the region in terms of five dimensions: Regulations and institutions, Project Preparation and Sustainability, Financing, Risk Management and Contract Monitoring, and Performance Evaluation and Impact. For this exercise we used Principal Component Analysis (PCA) to create an index, composed of the governance variables with the highest variance. The results show that Brazil, Chile and Colombia have the best governance conditions for PPPs. In addition, Peru, Costa Rica, El Salvador, and Mexico also have desirable levels of governance, given that they are above 50 points. Finally, Nicaragua, Trinidad and Tobago, Venezuela and Barbados are the only countries that show governance deficits.

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Appendix

Appendix A: Governance of PPPs in the selected countries

Tabla. 8. Governance of PPPs in the selected countries

Country	Public-Private Partnerships Law / Concessions Law	Awarding authority	PPP Unit
Colombia	Law N° 1508/2012 (PPP Law) and Decree N° 1467/12 (PPP regulations), compiled in Law N° 1082/15. These PPP laws are applicable to both state and sub-state governments. Sectors within the private investment regime may opt not to be regulated by PPP laws: telecommunications, energy, ports and terminals, airport terminals, mining, oil and gas. For example, there are specific laws such as Decree No. 063/15 on drinking water and sanitation. Infrastructure Law: Law No. 1682/13. General procurement framework (Law No. 80/93, Law No. 1150/07 and Law No. 1510/13) for matters not specifically regulated in the aforementioned laws. The following sectors are excluded: energy services, telecommunications, sanitary services and the specific cases of the port of Limón, Caldera and Puntarenas. Includes unsolicited proposals. Laws N° 7762 and N° 8643 set out the concession framework and the creation of a Concession Council.	Any governmental agency	There is no specific PPP Unit, but there is the National Planning Department (planning and supervision, with the Support Program for Public Private Participation in Infrastructure), the Colombian National Infrastructure Agency (ANI) and the Virgilio Barco Vargas National Real Estate Agency (supervision and management). The Ministry of Finance and Public Credit is responsible for the approval and evaluation of the financial conditions. The National Council for Social and Economic Policy approves those PPP contracts that have an execution term of more than 30 years. The Superior Council of Fiscal Policy (CONFIS) authorizes public contracts, as well as the use of public resources for PPP projects.

Source: CAF (2019). Own elaboration.

Tabla. 9. Governance of PPPs in the selected countries - Continuation

Chile	Law No. 20410/2010 (Amendment to the Public Works Concessions Law - Decree No. 900/96).	Coordination of Public Works Concessions of the Ministry of Public Works	Coordination of public works concessions of the Ministry of Public Works. Control: Fiscal Inspector and the Ministry of Public Works (MOP). Evaluation: National Public Investment System (SNIP).

Source: CAF (2019). Own elaboration.

Tabla. 10. Governance of PPPs in the selected countries - Continuation

Peru	Legislative Decree No. 1224/15, regulated by Supreme Decree No. 410/15: establishment of investment committees, emphasizing evaluation reports, with the possibility of submitting unsolicited proposals and a fast-track process (3). This incorporates the good practices recommended in the OECD's Principles for Public Governance of Public-Private Partnerships. Legislative Decree No. 1012/08 (framework law on PPPs and rules for the Accelerated Private Investment Promotion Process) and Decree No. 127/14 ("PPP Regulation"). Supreme Decree No. 059-96 (Concession Law) and Supreme Decree No. 060-96 (Concession Regulations) for the awarding of PPPs. Law No. 27293/00 (National Public Investment Law). Resolution No. 3656/12: parameters for the evaluation of the PPP mechanism as a project execution method. Supreme Decree No. 054/13: special provisions for the execution of administrative procedures - PPP. Directive Nº 004/09 (Proinversion): process and evaluation of private initiatives in investment projects.	All non-financial public sector entities	Private Investment Promotion Agency (Proinversion), responsible for regulation, policy direction and training for other public authorities, promotion of PPPs, technical support in project implementation and awarding. Agencies that regulate PPPs: Osiptel, for telecommunications; Osinergmin, for energy; Sunass, for water and sanitation; and Ositran for transportation. National Private Investment Promotion System: The Ministry of Economy and Finance, the General Directorate of Private Investment Promotion Policy (DGPPIP) and the specialized investment supervision team, Proinversion, regional and local governments, sector-specific regulatory bodies and other public entities and agencies.

Source: CAF (2019). Own elaboration.